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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/752,399	01/06/2004	Jing Chung Chang	SO-0033 US NA	3588

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EXAMINER	
BUTLER, PATRICK NEAL	
ART UNIT	**PAPER NUMBER**
1732	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/752,399	CHANG ET AL.	
	Examiner	Art Unit	
	Patrick Butler	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09 February 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 09 February 2004 lists a foreign patent document not in the English language. No translation has been provided by the Applicant, and this has been indicated by the Examiner on the Applicant's PTO/SP/08A (substitute for Form PTO-1449). For purposes of examination, US Patent Application Publication No. 2002/0132116 A1 is relied upon as a translation of WO02/36862A1.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howell et al. (International Publication Number WO 96/00808) in view of Hwo et al. (US Patent Application Publication No. 2002/0130433 A1), Wandel et al. (US Patent Application Publication No. 2002/0132116 A1) and Sun et al. (US Patent Application Publication No. 2002/0147298 A1).

4. With respect to claim 1, Howell teaches extruding poly(trimethylene terephthalate) to make BCF yarn. The filaments are converged (see Figure 2, Ref. # 2 - filaments approaching Ref. # 14) and cooled (see page 2, lines 37-39). Howell teaches that the yarn is drawn at least 800 m/min. (see page 3, lines 10-15). The filaments have a denier between 4 and 25 (see page 6, lines 3-7), which reads on the claimed range of

filament denier greater than 1. The total denier, interpreted by the examiner to be synonymous with yarn denier, is between 700 and 5,000 (see page 6, lines 3-7), which reads on the claimed range of yarn denier greater than 210.

5. Howell does not teach the specific molecular weight or a specific melt viscosity of the extruded poly(trimethylene terephthalate) or the extent of speeds above 800 m/min.

6. Hwo teaches extruding poly(trimethylene terephthalate) with a draw speed of 2,450 to 10,000 m/min. (see page 2, paragraph 19), which reads on the claimed speed of greater than 3,000 m/min. It would have been obvious to combine Hwo's draw speed with Howell's process in order to maximize production speeds.

7. Howell in view of Hwo discloses the claimed invention except specific molecular weight and specific melt viscosity of the extruded poly(trimethylene terephthalate). However, it is inherent in melt extrusion of synthetic yarn spinning of polymers that a high melt viscosity such as 350 Pascals at 250°C and 48.65 is needed to effectively produce yarn, and it is inherent that polymers have high number average molecular weight of at least 26,500. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a polymer with characteristics such as a number average molecular weight at least about 26,500 and a melt viscosity of 350 Pascals at 250°C and 48.65 per second shear rate to effectively extrude filaments to create yarn with desired denier at a desired speed, since it has been held that discovering an optimum value of a resultant effective variable involves only routine skill in the art. In re Aller, 105 USPQ 233.

8. Moreover, Wandel teaches an example of poly(trimethylene terephthalate) with a melt viscosity of 325 Pa s, which demonstrates that melt viscosity of about 350 Pascals at 250°C and 48.65 per second shear rate is taught. In view Wandel's specification, the melt viscosity of 325 Pa s was an example, and could be optimized for resultant effective variables such as processing speeds and denier. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Wandel's optimizeable melt viscosity with the process taught by Howell in view of Hwo in order to effectively practice extrusion of poly(trimethylene terephthalate) for filaments.

9. Moreover, Sun teaches using poly(trimethylene terephthalate) with a number average molecular weight of less than 40,000 (see Page 5-6, Paragraph 67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Sun's molecular weight with the process taught by Howell in view of Hwo and Wandel because when a polyester composition is melt spun into fibers or filaments, long chain length linear polymer molecules are desirable (see Page 6, paragraph 70).

10. With respect to claim 2-4, utilizing high number average molecular weight is an optimized value of a resultant effective variable and involves only routine skill in the art, as previously described and is taught by Howell in view of Hwo, Wandel, and Sun. Therefore, it would have been obvious to optimize the number average molecular to a range of 29,000 to 40,000. Moreover, Sun teaches using polyester with a number average molecular weight less than 40,000 (see Page 5-6, Paragraph 67), which reads on the claimed ranges of 26,500-50,000 (Claim 2), 27,500-45,000 (Claim 3), and 29,000-40,000 (Claim 4).

11. With respect to claims 5-8, utilizing proper melt viscosity is an optimized value of a resultant effective variable and involves only routine skill in the art, as previously described. Therefore, it would have been obvious to optimize the poly(trimethylene terephthalate) to have a melt viscosity of 500-700 Pascals at 250 degrees C and 48.65 per second shear rate, which reads on the claimed ranges of 350-1000 (Claim 5), 400-900 (Claim 6), 450-800 (Claim 7), and 500-700 (Claim 8).

12. With respect to claims 9-11, Howell teaches filaments with a denier between 4 and 25 (see page 6, lines 3-7), which reads on the claimed range of filament denier of at least 3 (Claim 9), at least 10 (Claim 10), and at least 15 (claim 11).

13. With respect to claims 12-14, Howell teaches the total (yarn) denier between 700 and 5,000 (see page 6, lines 3-7), which reads on the claimed range of yarn denier at least 250 (Claim 12), at least 500 (Claim 13), and at least 1000 (Claim 14).

14. With respect to claims 15-19, Howell in view of Hwo, Wandel, and Sun teach extruding molten poly(trimethylene terephthalate) as previously described. Moreover, Hwo teaches extruding poly(trimethylene terephthalate) with a draw speed of 2,450 to 10,000 m/min. (see page 2, paragraph 19), as previously described. This draw speed range reads on the claimed speeds of greater than 3,500 m/min. (claim 15), at least 4,000 m/min. (claim 16), at least 5,000 m/min. (claim 17), at least 5,100 m/min. (claim 18), and at least 5,500 m/min. (claim 19).

15. With respect to claim 20, Howell teaches coating the filaments with a spin finish (page 3, line 1), which reads on the claim language. The claim language allows for "optionally preintermingling the filaments", and because a process order is not claimed,

it does not distinctly claim what intermingling is "pre-" to. The examiner interprets "pre-" to require intermingling be done before another portion the claimed process, which is taught by Howell by intermingling prior to wind-up (see page 15, lines 27-30).

16. With respect to claim 21, Howell teaches bulking the drawn filaments (see page 3, lines 10-15).

17. With respect to claim 22, Howell teaches entangling the filaments (see page 15, lines 27-30).

18. With respect to claim 23, Howell teaches that the bulking of the filaments is done in a 3-D manner (see page 3, lines 10-15).

19. With respect to claim 24, Howell teaches bulking the filaments by blowing and deforming with a hot-fluid jet bulking unit (see page 5, lines 5-12).

20. With respect to claims 25-27, Hwo teaches drawing the filaments at a ratio of 0.7-3.0 (see page 2, paragraph 19), which reads on the claimed range of 1.1-4.0 (claim 25), 1.2-3.0 (claim 26), and 1.4-2.2 (claim 27).

21. With respect to claims 28-30, Howell teaches extruding poly(trimethylene terephthalate) with an intrinsic viscosity in the range of 0.6 to 1.3 (see page 2, lines 31-36), which reads on the claimed range of about 0.95 to about 1.10 (Claim 28), 0.98-1.04 (Claim 29), and 1.00-1.02 (Claim 30).

22. With respect to claim 31, Howell in view of Hwo, Wandel, and Sun teach extruding molten poly(trimethylene terephthalate) to make bulked yarn as previously described. Additionally, Howell teaches using poly(trimethylene terephthalate) with water content less than 100 ppm (page 14, lines 5-10). Utilizing high number average

molecular weight is an optimized value of a resultant effective variable and involves only routine skill in the art, as previously described and is taught by Howell in view of Hwo, Wandel, and Sun. Therefore, it would have been obvious to optimize the number average molecular to a range of 26,500 to 50,000. Moreover, Sun teaches using polyester with a number average molecular weight less than 40,000 (see Page 5-6, Paragraph 67). Howell teaches coating the cooled filaments with spin finish (see page 3, line 1 and see Ref. # 2 - filaments coated at Ref. # 18 after cooling in Ref. # 16). Howell teaches heating the filaments to a temperature greater than the glass transition temperature of the filaments, but less than 200°C (see page 14, lines 20-24), which meets the claimed language in part (e) of the Claim. Howell teaches cooling the bulked continuous filaments to a temperature less than the glass transition temperature of the filaments (see Page 14, lines 32-34).

23. With respect to claims 32 and 33, Hwo teaches using poly(trimethylene terephthalate) chips dried to a water content less than 30 ppm (see Page 2, paragraphs 25 and 26), which reads on the claimed range of less than 50 ppm (Claim 32) and less than 40 ppm (Claim 33).

24. With respect to claim 34, Howell discloses the claimed invention except for having the entangling unit before the cooling unit. It would have been obvious to one having ordinary skill in the art at the time the invention was made to reverse the order of the units cooling and entangling, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

25. With respect to claim 35-40, Howell in view of Hwo, Wandel, and Sun teach extruding molten poly(trimethylene terephthalate) as previously described. Moreover, Hwo teaches extruding poly(trimethylene terephthalate) with a draw speed of 2,450 to 10,000 m/min. (see page 2, paragraph 19), as previously described. This draw speed range reads on the claimed speeds of at least 3,000 m/min. (claim 35), greater than 3,500 m/min. (claim 36), at least 4,000 m/min. (claim 37), at least 5,000 m/min. (claim 38), at least 5,100 m/min. (claim 39), and at least 5,500 m/min. (claim 40).

26. With respect to claim 41 and 42, Howell teaches carpets made from poly(trimethylene terephthalate) yarns that are twisted, heat set, and then tufted into carpet (see page 7, lines 1-8), which reads on the claimed process (claim 41) of ply-twisting and heat-setting the filaments and claimed product (claim 42) of carpet made from the carpet.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Butler whose telephone number is 571-272-8517. The examiner can normally be reached on Monday through Friday 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PB 26 May 2005

Patrick Butler
Examiner
Art Unit 1732

MICHAEL P. COLAIANNI
SUPERVISORY PATENT EXAMINER